TV-131

USA Model

B & W TV

SPECIFICATIONS

Television System:	American TV standards
Picture Tube:	33 cm, 13" (measured diagonally), 90° deflection
Semiconductors:	28 transistors, 18 diodes and 1 IC
Antennas:	VHF: Built-in telescopic antenna with external antenna provision (300 Ω balanced) UHF: 300 Ω balanced (loop antenna*) *Note: Supplied with accessories
Channel Coverage:	VHF channels: 2 – 13 UHF channels: 14 – 83 (70-position detent tuner)
Intermediate Frequencies:	Picture i-f carrier: 45.75 MHz Sound i-f carrier: 41.25 MHz
Sound System:	4.5 MHz intercarrier Output power: 800 mW (at 10 % harmonic distortion) Speaker: 12 x 8 cm (4¾ x 3⅛ inches) oval, 8 Ω
Automatic Controls:	AFC (automatic frequency control) AGC (automatic gain control)
Anode Voltage:	13 kV at 120 μA
Power Requirements:	120 V AC, 60 Hz
Power Consumption:	35 W (max)
Dimensions:	342 (w) x 373 (h) x 331.5 (d) mm 13½(w) x 14¾(h) 13⅛(d) inches
Net Weight:	8.3 kg (18 lb 4 oz)
Accessories:	Earphone (ME-20B) Loop antenna (AN-8) Instruction manual

X-RAY RADIATION WARNING!!

REPLACE COMPONENTS IDENTIFIED ON THE SCHEMATIC DIAGRAMS BY SHADING WITH SONY PARTS HAVING THE PART NUMBERS GIVEN IN THIS MANUAL, OR APPROVED SUPPLEMENTS, ONLY. CHECK HIGH VOLTAGE USING THE VALUE AND OPERATING CONDITIONS SHOWN ON THE SCHEMATIC DIAGRAM.

SONY®

SERVICE MANUAL

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.

2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.

3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.

4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.

5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

7. Check the condition of the monopole antenna (if any). Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.

8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.

9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground must not exceed 0.2 mA (200 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.

2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.3 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A.)

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most a-c outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60 – 100 watt trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line. The lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B.)

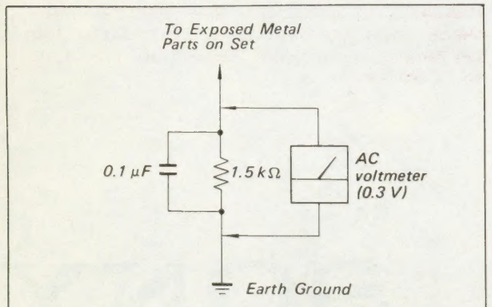


Fig. A. Using an AC voltmeter to check AC leakage.

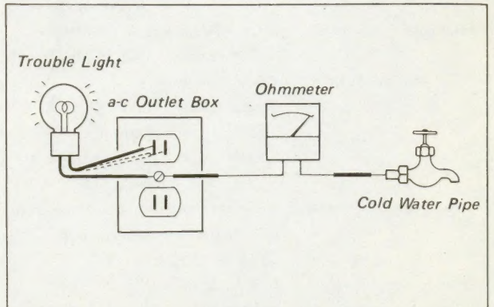


Fig. B. Checking for earth ground.

SECTION 1
BLOCK DIAGRAM

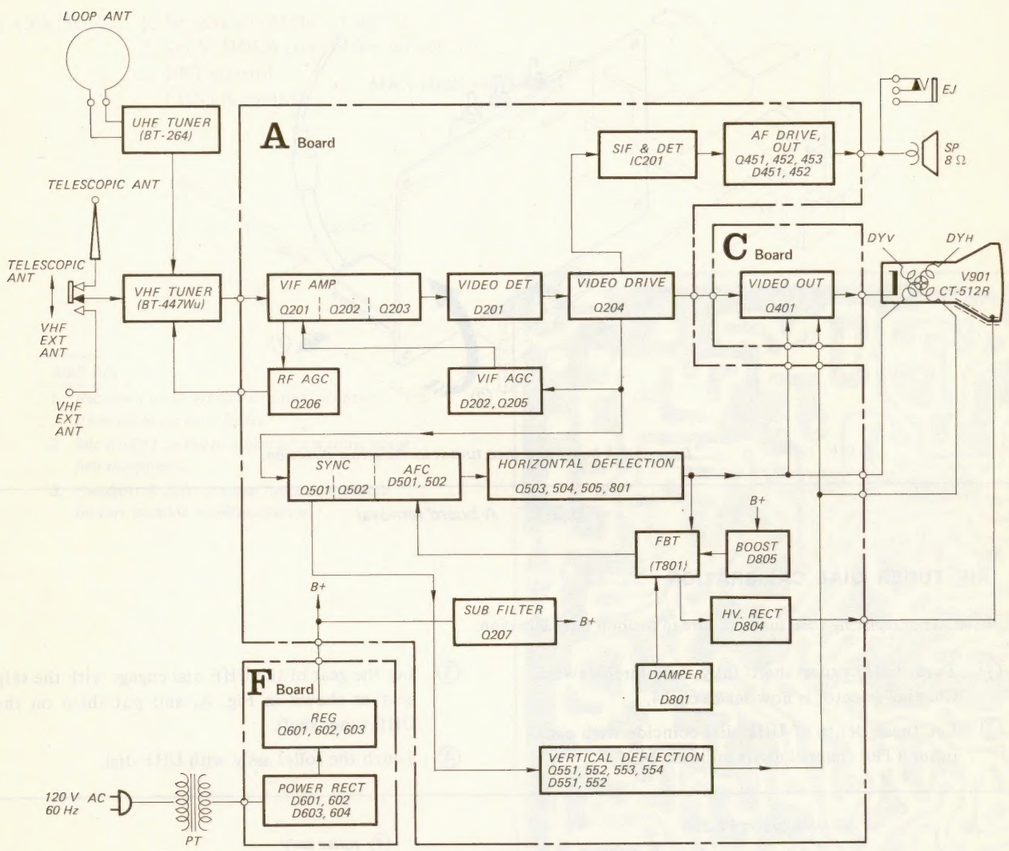


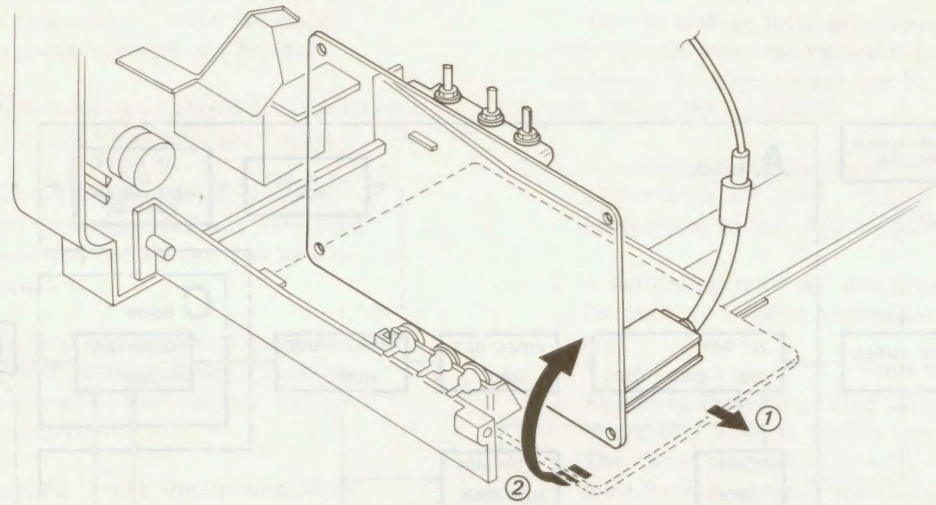
Fig. 1-1. Block diagram

SECTION 2
DISASSEMBLY AND REPLACEMENT

2-1. A BOARD REMOVAL

Circled numbers indicate sequence.

Note: When removing the cabinet or the chassis, take out all the screws marked ⇒ on them.



Draw out A board and then turn it in the arrow direction.

Fig. 2-1. A board removal

2-2. UHF TUNER DIAL CALIBRATION

Note: After replacing UHF tuner, be sure to perform this calibration.

① Turn UHF tuner shaft fully counterclockwise. Channel selector is now set to ch-14.

② Let these dents of UHF dial coincide with each other. (The channel digits indicate 14.)

③ Let the gear of the UHF dial engage with the skip gear as shown in Fig. A, and put them on the UHF tuner shaft.

④ Touch the roller ass'y with UHF dial.

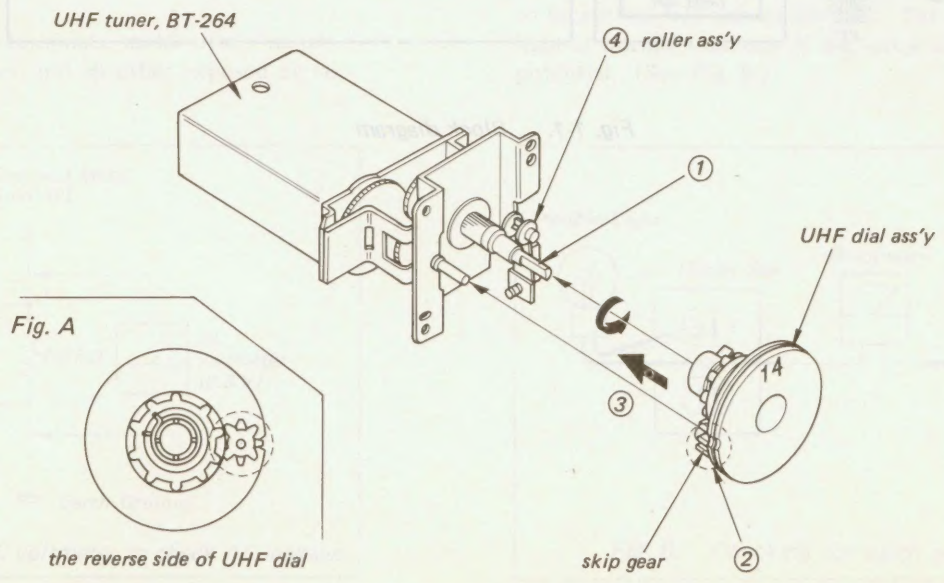


Fig. 2-2. UHF tuner dial calibration

SECTION 3
CIRCUIT ADJUSTMENTS

Note: Test Equipment Required . . . . . VOM

3-1. AGC, V. SIZE, H. FREQ, SIF AND H. SIZE ADJUSTMENTS

PREPARATIONS:
1. Receive an off-the-air signal.
2. Set V. HOLD control for correct sync.
3. BRT control, CONTR control } · · · MAX (fully clockwise)

AGC Adj
1. *Receive a weak off-the-air signal to obtain snow noise on the picture.*
2. *Set RV201 to the position where snow noise just disappears.*
3. *Readjust RV201 if snow noise or unstable picture persists in other channel.*

Vertical Size Adj
1. *Complete preparations.*
2. *Adjust RV552 for best vertical size.*

Horizontal Frequency Adj
1. *Complete preparations.*
2. *Adjust RV501 for correct horizontal sync.*
3. *If correct horizontal sync is not observed, turn off and on the set.*

SIF Adj
1. *Receive an off-the-air signal.*
2. *Adjust T203 for the maximum and clearest sound.*
3. *Confirm that no buzz sound is heard.*

Horizontal Size Adj
1. *Complete preparations.*
2. *Select capacitance value for best horizontal size.*

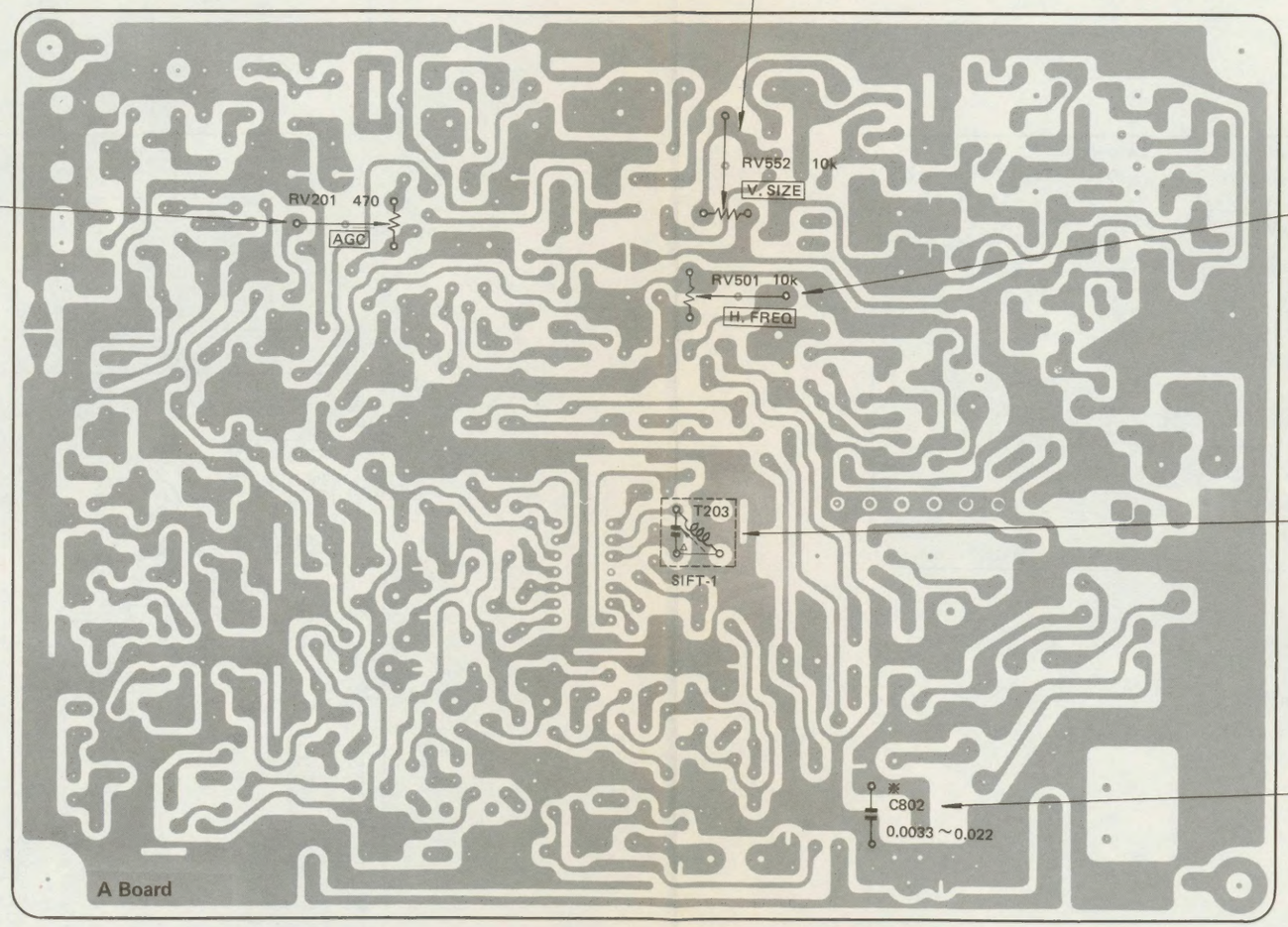


Fig. 3-1. AGC, V. SIZE, H. FREQ, SIF and H. SIZE adjustments

3-2. AVR ADJUSTMENT

PREPARATIONS: 1. Receive an off-the-air signal.
2. Set V. HOLD control for correct sync.
3. BRT control . . . . . MAX (fully clockwise)
CONTR control . . MIN (fully counterclockwise)

AVR Adj

1. *Confirm that the ac power is 120V.*
2. *Receive an off-the-air signal.*
3. *Adjust RV601 for 12V.*

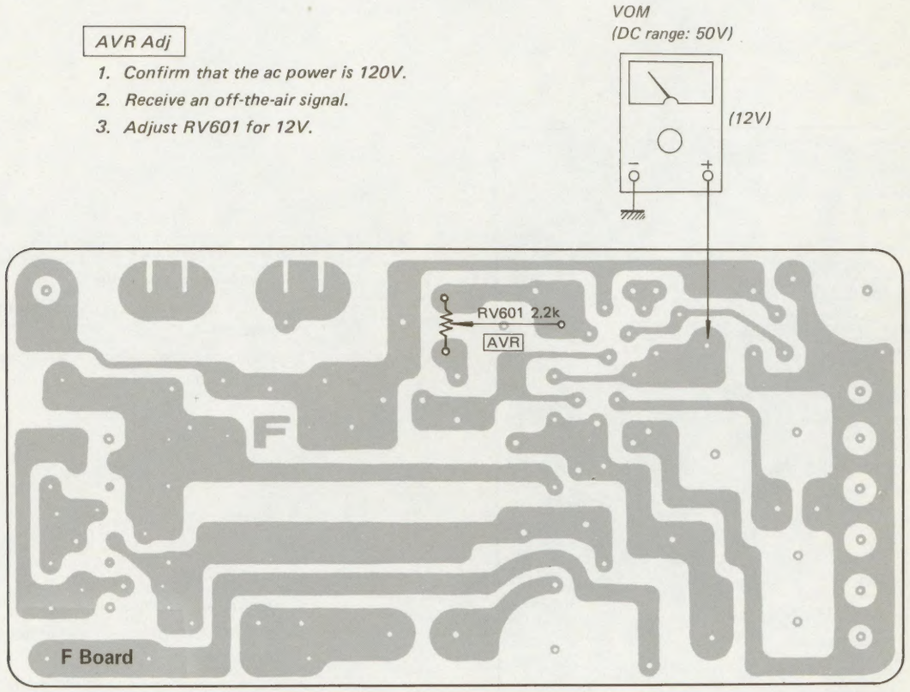
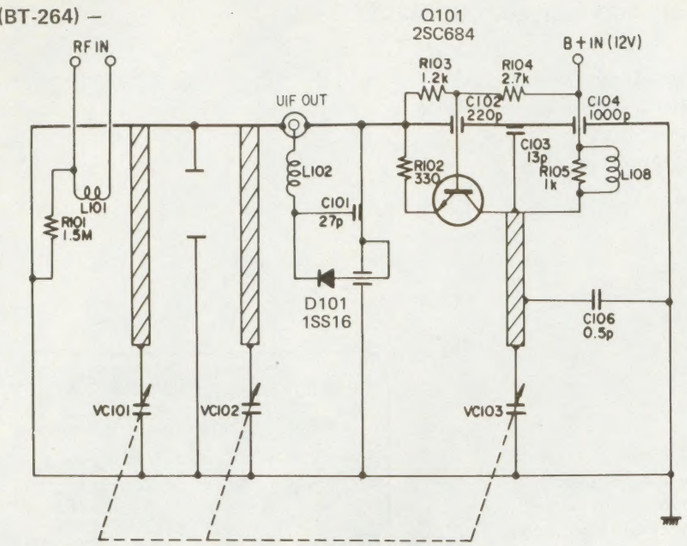


Fig. 3-2. AVR adjustment

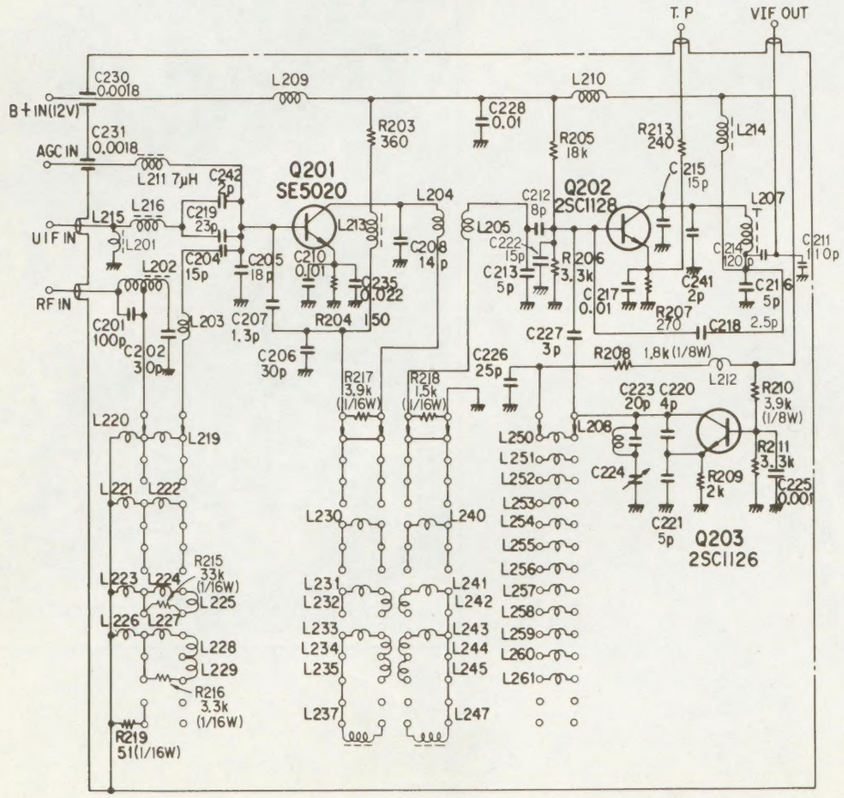
SECTION 4
DIAGRAMS

4-1. SCHEMATIC DIAGRAMS – UHF and VHF Tuners –

– UHF tuner (BT-264) –



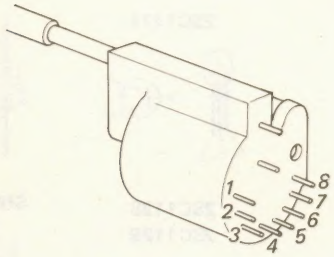
– VHF tuner (BT-447Wu) –

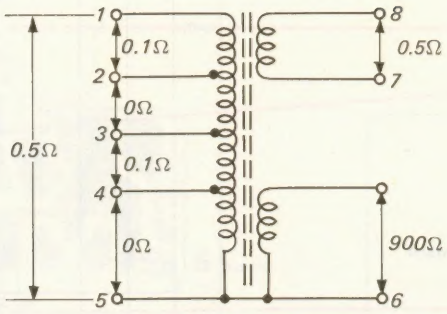


Note: Tuner reference numbers are not included in the Electrical Parts List (P. 17 ~ 20).

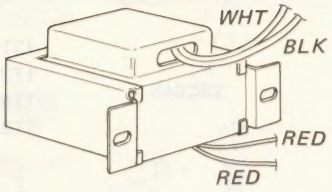
4-2. DC RESISTANCE AND WINDING DIAGRAMS OF TRANSFORMERS

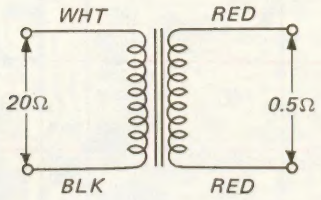
T801 (FBT)



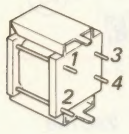


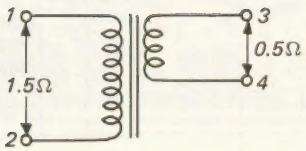
T901 (PT)





T501 (HDT)



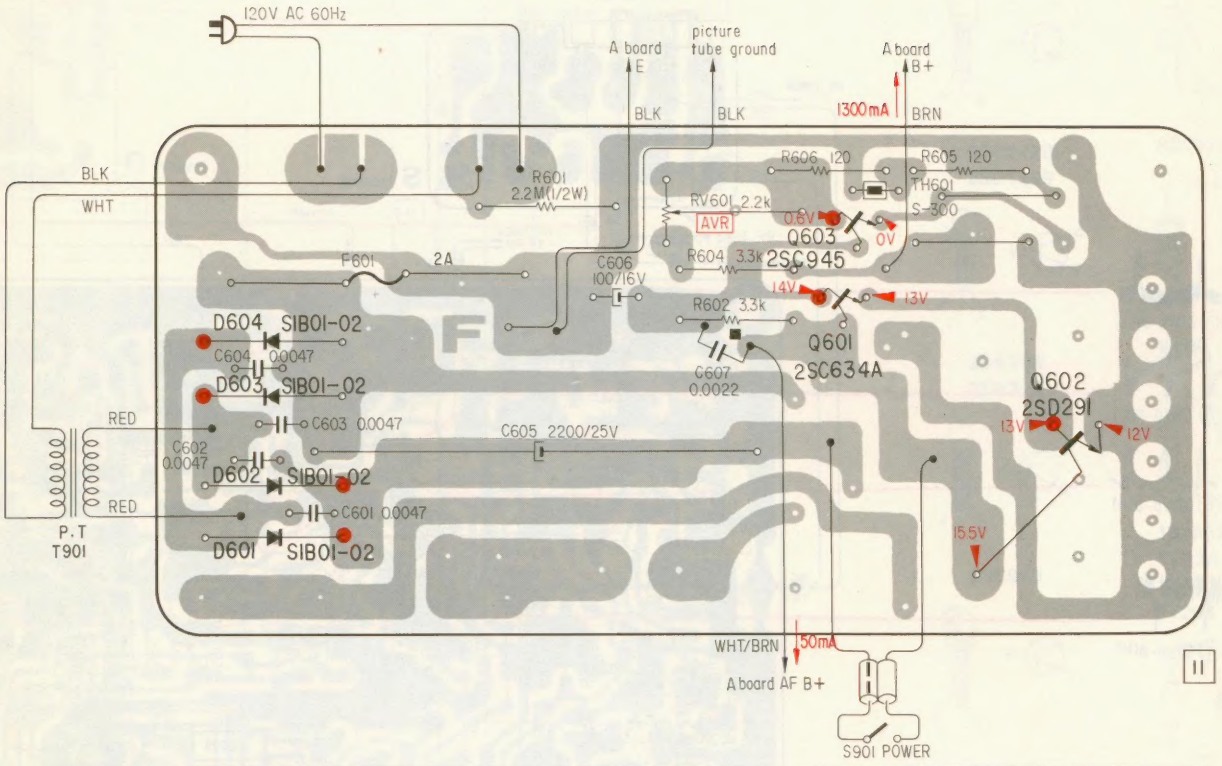


Note: DC resistance is measured with coils disconnected from circuit.

4-3. MOUNTING DIAGRAM – F Board –

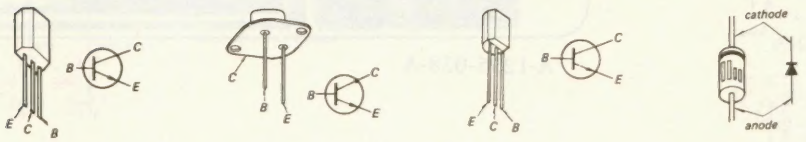
– Conductor Side –

F



Q	Q601, Q603		Q602
D	D603, D604, D601, D602		
ADJ	RV601		

2SC634A **2SD291** **2SC945** **SIB01-02**



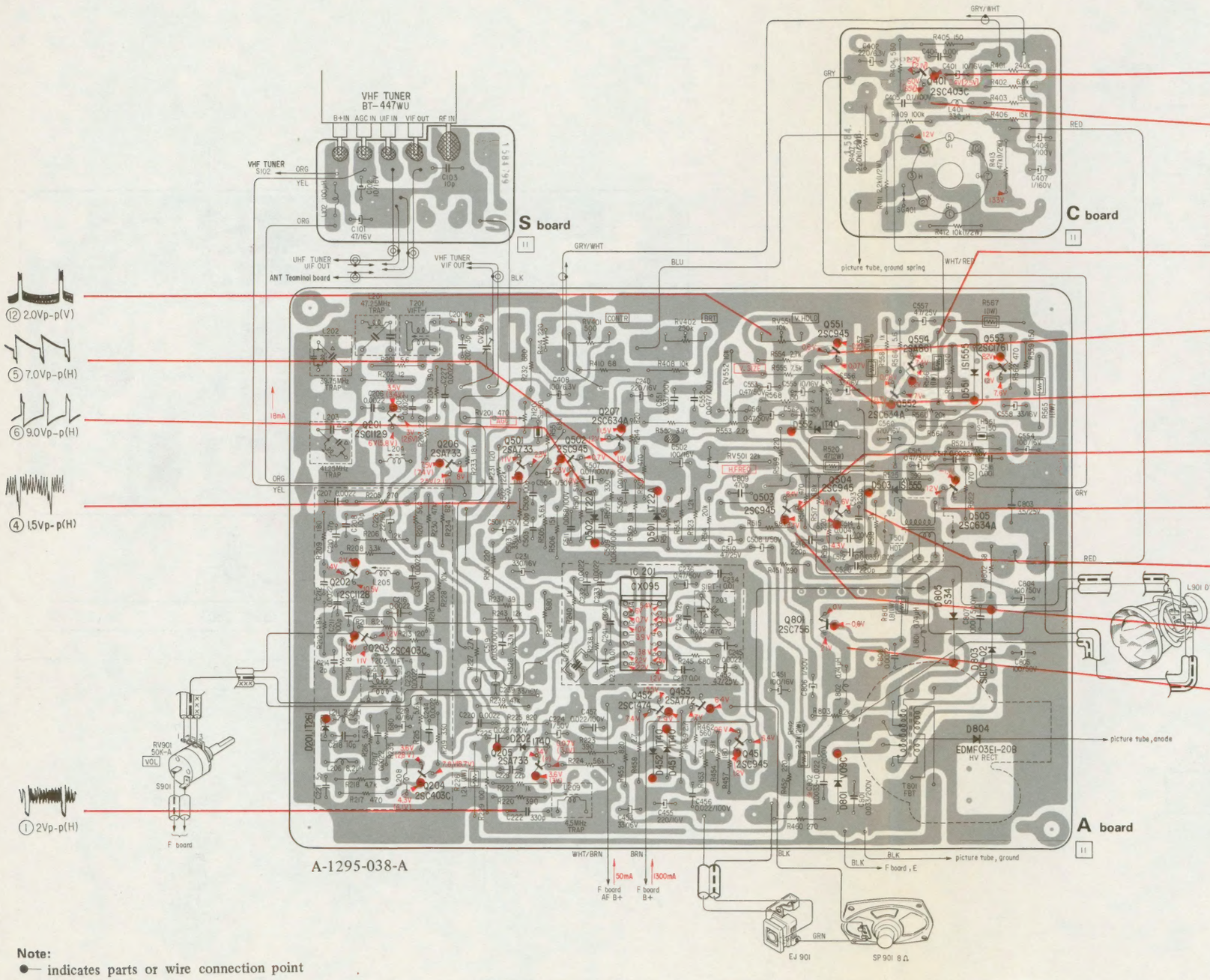
Note: ▭ indicates the adjustment for repair.

Note:
- ●— indicates parts or wire connection point on the conductor side.
- ○— indicates parts or wire connection point through the component side.
- ▭ indicates a nonflammable resistor.
- ■ indicates parts on the conductor side.

4-4. MOUNTING DIAGRAM – A, C & S Boards –

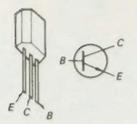
– Conductor Side –

A S C

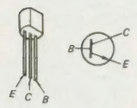


Q, IC	D	ADJ
Q440I		
Q551		RV401
Q553		RV402
Q554	D551	RV551
Q552		RV552
Q201	D552	RV201
Q207		
Q206		
Q501		RV501
Q502		
Q505		
Q503	D503	
Q504		
	D501 D502	
Q202		
		T203
Q801		
IC201	D805	
Q203	D803	
Q452	D201	
Q453	D451	
Q451	D452	
	D202	
	D801	
Q205	D804	
Q204		C802
		L209

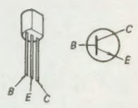
2SC403C
2SC634A



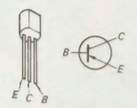
2SC1474



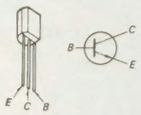
2SC1128
2SC1129



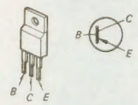
2SA733
2SA772



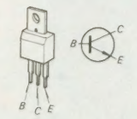
2SC945



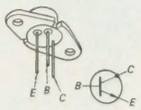
2SA861



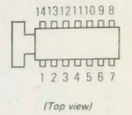
2SC1761



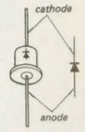
2SC756



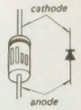
CX095



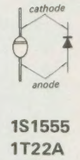
S34



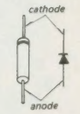
SIB01-02



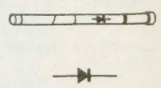
V09C



1S1555
1T22A
1T40
1T261



EDMF03E1-20B



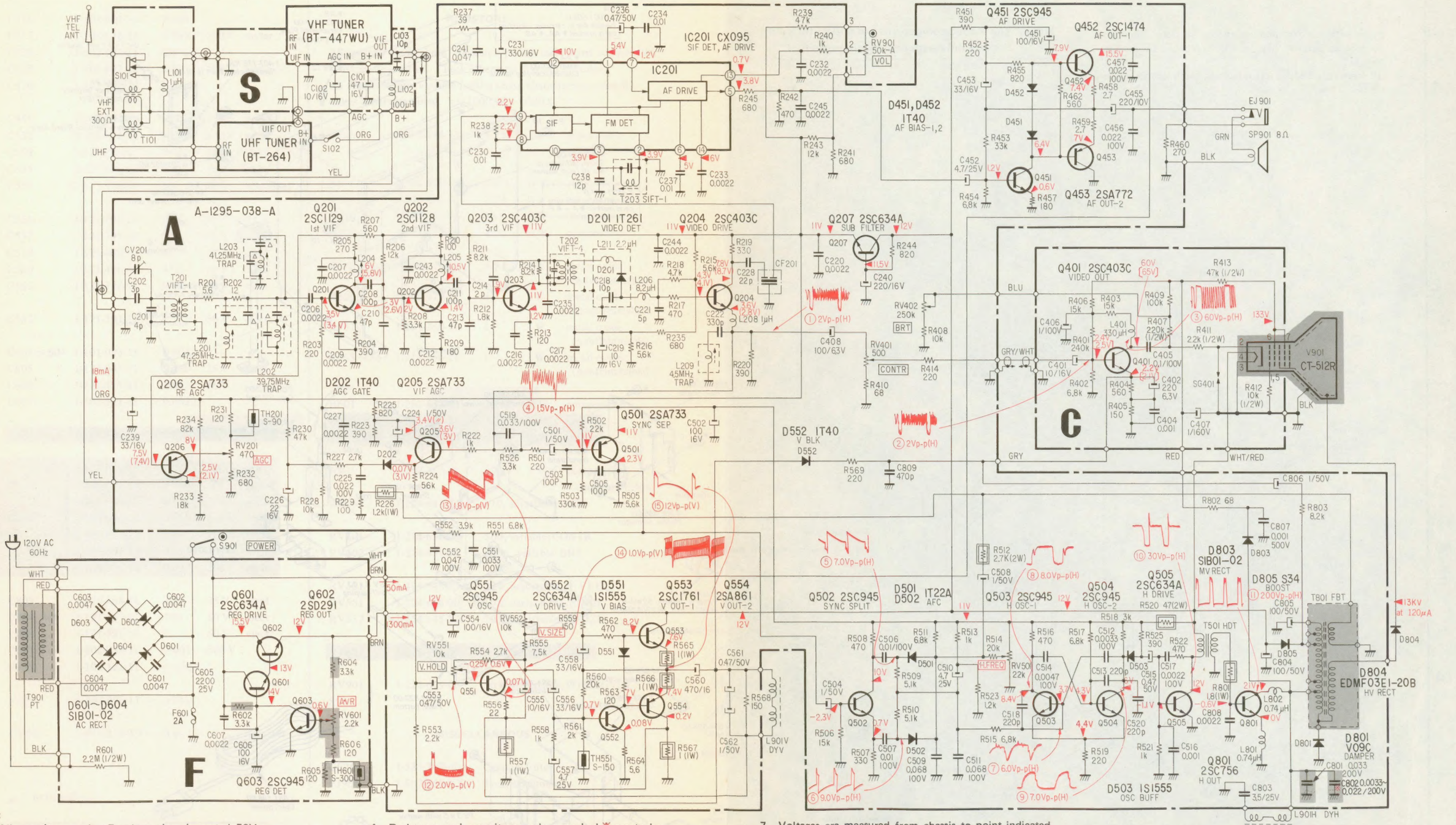
Note:
- ●— indicates parts or wire connection point on the conductor side.
- ○— indicates parts or wire connection point through the component side.
- ▭ indicates a nonflammable resistor.
- ※ indicates parts to be selected.

Note: Voltages in ( ): taken with no signal input
Voltages in ( ): taken with signal input
(BRT control ..... MAX
CONTR control .. MIN)

▭ indicates the designation on the panel.
▭ indicates the adjustment for repair.

Note: The shaded components are critical for safety. Replace only with part number specified.

4-5. SCHEMATIC DIAGRAM



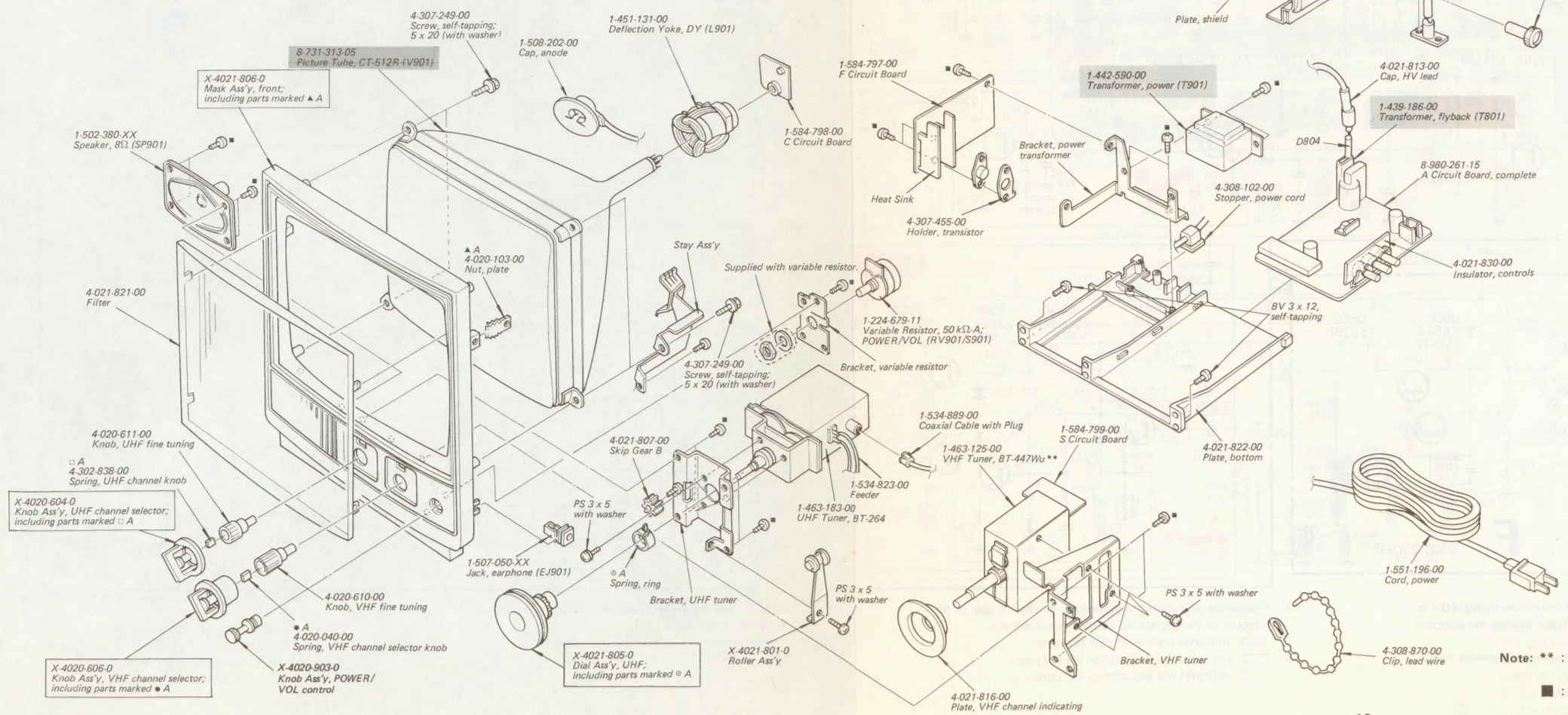
Note:

1. All capacitors are in μF unless otherwise noted. 50V or less working voltages are omitted except for electrolytic type. p = μμF
2. All resistors are in ohms, ¼W unless otherwise noted. k = 1000, M = 1000k
3. △ indicates internal components.
4. Resistance and capacitance values marked ※ are to be selected to yield specified operating conditions.
5. ▭ indicates nonflammable resistors.
6. ▭ indicates the designation on the panel.
   ▭ indicates the adjustment for repair.
7. Voltages are measured from chassis to point indicated by using a VOM (20kΩ/V).
   Readings in ( ): taken with no signal input
   Readings in [ ]: taken with signal input
   (BRT control . . . . MAX
   CONTR control . . . MIN)
   Variations may be noted due to normal production tolerances.
8. ◉ S901 and RV901 are coupled.
9. All adjustable and variable resistors have characteristic curve B, unless otherwise noted.
10. S102 is mounted on VHF tuner.

SECTION 5
EXPLODED VIEW

Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.

Note: The shaded components are critical for safety. Replace only with part number specified.



Note: ** : BT-446Wu (Part No. 1-463-082-00) is supplied as a replacement tuner.
■ : BV 3 x 10, self-tapping

SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
		TUNERS AND CIRCUIT BOARDS
	1-463-125-00	VHF Tuner, BT-447Wu**
	1-463-183-00	UHF Tuner, BT-264
	1-584-797-00	F Circuit Board
	1-584-798-00	C Circuit Board
	1-584-799-00	S Circuit Board
	8-980-261-15	A Circuit Board, complete
		**BT-446Wu (Part No. 1-463-082-00) is supplied as a replacement tuner.
		SEMICONDUCTORS
		Transistors
Q201		2SC1129
Q202		2SC1128
Q203, 204		2SC403C
Q205, 206		2SA733
Q207		2SC634A
Q401		2SC403C
Q451		2SC945
Q452		2SC1474
Q453		2SA772
Q501		2SA733
Q502 ~ 504		2SC945
Q505		2SC634A
Q551		2SC945
Q552		2SC634A
Q553		2SC1761
Q554		2SA861
Q601		2SC634A
Q602		2SD291
Q603		2SC945
Q801		2SC756
		Diodes
D201		1T261
D202		1T40
D451, 452		1T40
D501, 502		1T22A
D503		1S1555
D551		1S1555
D552		1T40
D601 ~ 604		SIB01-02
D801		V09C
D803		SIB01-02
D804		EDMF03E1-20B
D805		S34
		IC
IC201		CX095
		Miscellaneous
Th201	1-800-194-00	Thermistor, S-90
Th551	1-800-378-00	Thermistor, S-150
Th601	1-800-196-00	Thermistor, S-300
		COILS
		All coils are microinductor unless otherwise noted.
L101	1-407-178-XX	1 μH
L102	1-407-169-XX	100 μH
L201	1-409-257-00	47.25 MHz Trap
L202	1-409-258-00	39.75 MHz Trap
L203	1-409-259-00	41.25 MHz Trap
L204, 205	1-404-012-00	Coil, variable
L206	1-407-189-XX	8.2 μH
L208	1-407-178-XX	1 μH
L209	1-409-179-00	4.5 MHz Trap
L211	1-407-182-XX	2.2 μH
L401	1-407-175-XX	330 μH
L801, 802	1-407-365-00	0.74 μH, spook choke
L901	1-451-131-00	Deflection Yoke, DY

Note: The shaded components are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description
		TRANSFORMERS
T101	1-417-014-21	Antenna Matching Transformer
T201	1-403-519-00	VIFT-1
T202	1-404-042-00	VIFT-4
T203	1-403-848-00	SIFT-1
T501	1-437-021-00	Horizontal Drive, HDT
T801	1-439-186-00	Flyback, FBT
T901	1-442-590-00	Power, PT
		CAPACITORS
		All capacitors are in μF and ceramic type unless otherwise noted. 50 V or less working voltages are omitted except for electrolytic type. pF = μμF, elect = electrolytic
C101	1-121-409-11	47 16 V elect
C102	1-121-651-11	10 16 V elect
C103	1-102-954-11	10 p
C201	1-102-937-11	4 p
C202	1-102-936-11	3 p
C206, 207	1-102-121-11	0.0022
C208	1-102-975-11	100 p
C209	1-102-121-11	0.0022
C210	1-101-881-11	47 p
C211	1-102-975-11	100 p
C212	1-102-121-11	0.0022
C213	1-101-881-11	47 p
C214	1-102-935-11	2 p
C216, 217	1-102-121-11	0.0022
C218	1-102-954-11	10 p
C219	1-121-651-11	10 16 V elect
C220	1-102-121-11	0.0022
C221	1-102-942-11	5 p
C222	1-103-663-11	330 p 50 V styrol
C224	1-121-391-11	1 50 V elect
C225	1-108-630-12	0.022 100 V mylar
C226	1-121-479-11	22 16 V elect
C227	1-102-121-11	0.0022
C228	1-102-967-11	22 p
C230	1-101-118-11	0.01
C231	1-121-521-11	330 16 V elect
C232, 233	1-102-121-11	0.0022
C234	1-101-004-11	0.01
C235	1-102-121-11	0.0022
C236	1-121-726-11	0.47 50 V elect
C237	1-101-004-11	0.01
C238	1-102-637-11	12 p
C239	1-121-403-11	33 16 V elect
C240	1-121-421-11	220 16 V elect
C241	1-101-006-11	0.047
C243 ~ 245	1-102-121-11	0.0022
C401	1-121-651-11	10 16 V elect
C402	1-121-419-11	220 6.3 V elect
C404	1-102-074-11	0.001
C405	1-108-638-12	0.1 100 V mylar
C406	1-121-148-11	1 100 V elect
C407	1-121-189-11	1 160 V elect
C408	1-121-413-11	100 6.3 V elect
C451	1-121-415-11	100 16 V elect
C452	1-121-395-11	4.7 25 V elect
C453	1-121-403-11	33 16 V elect
C455	1-121-420-11	220 10 V elect
C456, 457	1-108-630-12	0.022 100 V mylar
C501	1-121-391-11	1 50 V elect
C502	1-121-415-11	100 16 V elect
C503	1-102-975-11	100 p
C504	1-121-391-11	1 50 V elect
C505	1-102-975-11	100 p
C506, 507	1-108-626-12	0.01 100 V mylar
C508	1-121-391-11	1 50 V elect
C509	1-108-636-12	0.068 100 V mylar
C510	1-121-395-11	4.7 25 V elect
C511	1-108-636-12	0.068 100 V mylar
C512	1-106-184-11	0.0033 100 V mylar
C513	1-102-983-11	220 p
C514	1-106-188-11	0.0047 100 V mylar
C515	1-121-726-11	0.47 50 V elect

Note: The shaded components are critical for safety. Replace only with part number specified.

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Ref. No.	Part No.	Description		
C516	1-101-001-11	0.001		
C517	1-108-618-12	0.0022	100 V	mylar
C518	1-102-983-11	220 p		
C519	1-108-632-12	0.033	100 V	mylar
C520	1-102-983-11	220 p		
C551	1-108-632-12	0.033	100 V	mylar
C552	1-108-634-12	0.047	100 V	mylar
C553	1-121-726-11	0.47	50 V	elect
C554	1-121-415-11	100	16 V	elect
C555	1-131-158-11	10	16 V	tantalum
C556	1-121-403-11	33	16 V	elect
C557	1-121-395-11	4.7	25 V	elect
C558	1-121-403-11	33	16 V	elect
C560	1-121-426-11	470	16 V	elect
C561	1-121-726-11	0.47	50 V	elect
C562	1-121-391-11	1	50 V	elect
C601 ~ 604	1-101-003-11	0.0047		
C605	1-121-035-11	2200	25 V	elect
C606	1-121-415-11	100	16 V	elect
C607	1-102-121-11	0.0022		
C801	1-108-698-12	0.033	200 V	mylar
※ C802	1-108-686-12	0.0033	200 V	mylar
	1-108-688-12	0.0047	200 V	mylar
	1-108-690-12	0.0068	200 V	mylar
	1-108-691-12	0.0082	200 V	mylar
	1-108-692-12	0.01	200 V	mylar
	1-108-694-12	0.015	200 V	mylar
	1-108-696-12	0.022	200 V	mylar
C803	1-123-168-11	3.5	25 V	elect
C804, 805	1-121-417-11	100	50 V	elect
C806	1-121-391-11	1	50 V	elect
C807	1-102-038-11	0.001	500 V	
C808	1-102-121-11	0.0022		
C809	1-102-098-11	470 p		
CV201	1-141-138-XX	8 p		trimmer

※ : to be selected

Note: The shaded components are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			
		RESISTORS			
		All resistors are in ohms. Regular-type ¼W carbon and composition resistors are omitted. Check schematic diagram for values. All adjustable and variable resistors have characteristic curve B, unless otherwise noted. k = 1000, M = 1000 k			
R226	1-213-144-11	1.2 k	1 W	metal oxide (nonflammable)	
R407	1-202-629-11	220 k	½ W	composition	
R411	1-202-581-31	2.2 k	½ W	composition	
R412	1-202-597-31	10 k	½ W	composition	
R413	1-202-613-31	47 k	½ W	composition	
R512	1-206-674-11	2.7 k	2 W	metal oxide (nonflammable)	
R520	1-206-479-11	47	2 W	metal oxide (nonflammable)	
R557	1-212-360-11	1	1 W	metal oxide (nonflammable)	
R565 ~ 567	1-212-360-11	1	1 W	metal oxide (nonflammable)	
R601	1-202-653-31	2.2 M	½ W	composition	
R602, 604	1-244-685-11	3.3 k	¼ W	carbon	
R605, 606	1-244-651-11	120	¼ W	carbon	
R801	1-202-363-31	1.8	1 W	composition (nonflammable)	
RV201	1-224-641-XX	470, adjustable; AGC			
RV401	1-224-656-00	500, variable; CONTR			
RV402	1-224-677-00	250 k, variable; BRT			
RV501	1-224-646-XX	22 k, adjustable; H. FREQ			
RV551	1-224-676-00	10 k, variable; V. HOLD			
RV552	1-224-645-XX	10 k, adjustable; V. SIZE			
RV601	1-222-785-00	2.2k, adjustable; AVR			
RV901, S901	1-224-679-00	50 k-A, variable; POWER/VOL			
		MISCELLANEOUS			
CF201	1-527-260-00	Ceramic Filter			
EJ901	1-507-050-XX	Jack, earphone			

Ref. No.	Part No.	Description
F601	1-532-268-11	Fuse, 2A
SG401	1-519-063-XX	Spark Gap, 1.5 kV
SP901	1-502-380-XX	Speaker, 8 Ω
V901	8-731-313-05	Picture Tube, CT-512R
	1-501-152-00	Telescopic Antenna (included in cabinet ass'y)
	1-508-202-00	Cap, anode
	1-526-521-XX	Socket, picture tube
	1-534-823-00	Feeder
	1-534-889-00	Coaxial Cable with Plug
	1-536-429-00	Antenna Terminal Board Ass'y
	1-551-196-00	Cord, power

Note: The shaded components are critical for safety. Replace only with part number specified.

PACKING MATERIALS AND ACCESSORIES

Part No.	Description
X-3701-030-5	Card Ass'y, warranty
1-501-102-00	Loop Antenna (AN-8)
1-504-034-32	Earphone (ME-20B)
3-701-355-00	Label, tack
3-701-625-00	Bag, polyethylene
4-021-826-00	Carton
4-021-827-00	Sheet, protection
4-021-828-00	Cushion, lower
4-021-829-00	Cushion, upper
4-491-057-13	Tag, eye-catcher
4-491-107-22	Card, instruction
4-493-131-11	Card, caution
4-495-565-21	Manual, instruction

9-962-224-01

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